

UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Richard G. MIDDLETON

Confirmation No.: 3772

Application No.: 10/802,060

Group Art Unit: 1751

Filing Date: March 16, 2004

Examiner: Necholus Ogden, Jr.

For: METHOD FOR CLEANING TEXTILE
ABSORBERS

Attorney Docket No.: 105124-4000

**SECOND DECLARATION OF RICHARD G. MIDDLETON
UNDER 37 C.F.R. § 1.132**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Richard G. MIDDLETON, do declare that:

1. I am a U.S. citizen and currently reside at 1271 First Street S.
Extension, Columbia, SC 29209.

2. I am the sole inventor of the invention described and claimed in the
above-identified patent application. I have been awarded at least half a dozen U.S. patents,
including U.S. Patent Nos. 6,230,353; 6,009,585; 5,916,336; and 5,538,646, for inventions
related to environmental technology and recycling.

3. I was awarded a B.A. in Risk Management from the University of Georgia in
1984. I have worked in the textile cleaning, recycling, and disposal industry for over 10 years. I
am currently the President and Founder of Circle Environmental, Inc., and have served as such
since 1996. In this role, I primarily oversee day-to-day operations at my cleaning and recycling
facilities, develop and maintain business relationships with customers and suppliers, and develop
new technologies and improvements in cleaning processes, equipment, and applications. My
company, Circle Environmental, was awarded both the South Carolina Governor's Pollution
Prevention Award and the "Best Waste Reduction Program from the South Carolina Department of
Health and Environmental Control in 2001. In 2004, Circle Environmental was accepted into the

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South Carolina Environmental Excellence Program. I have also been asked to join, and have participated in, the South Carolina Environmental Technology Committee on an ongoing basis.

4. I have reviewed and understand the above-identified patent application, the pending claims contained therein, the rejections of the Office Action dated June 17, 2005, and the references cited by the Examiner in this application. Specifically, these references include my U.S. Patent No. 6,230,353 (the "'353 patent"), my U.S. Patent No. 6,536,061 (the "'061 patent"), and European Patent Application No. EP1300501 to Carnovale ("Carnovale"). I am submitting the following comments as one of ordinary skill in the art in support of the patentability of the claims in this application over the references of the '353 and '061 patents, and Carnovale.

5. The above-identified application is generally directed to methods for cleaning textile absorbers and removing extraneous substances therefrom. In particular, the cleaning is performed by using a cleaning fluid that comprises n-propyl bromide ("n-PB"). In one preferred embodiment, the cleaning fluid includes n-PB essentially free of hazardous materials that are typically added as stabilizers to commercially available n-PB. The claimed methods using n-PB as a cleaning fluid provide many surprising and unexpected benefits in dry cleaning applications, as compared to the traditionally-used perchloroethylene ("PERC"). Such advantages include the fact that the use of n-PB as claimed is non-hazardous as recognized by the U.S. Environmental Protection Agency ("EPA"), more effective at separating oil and grease from textile absorbers, and results in the textile absorbers having a fresher scent and softer feel. Additionally, n-PB can be stored in a dry cleaning device at ambient temperatures without undue evaporation, and the amount of shrinkage observed in the cleaned materials is reduced due to the decreased drying time and temperatures that can be achieved when using n-PB as a cleaning fluid. Other surprising and unexpected advantages are described in my Declaration previously submitted on March 17, 2005. Indeed, to the best of my knowledge, no commercially available dry cleaning equipment or methods exist that use n-PB as a dry cleaning fluid. In fact, I was completely unaware of this material or its properties until I conducted experimentation and discovered its beneficial use in dry cleaning applications after my '353 patent was filed. Moreover, I have recently been issued what I understand is the world's first permit, from the Department of Health and Environmental Control of the state of South Carolina, which will permit dry cleaning operation using the claimed n-PB of the invention on a commercial scale.

6. The '353 patent discloses a method for separating oil from oil-absorbent materials, including placing the oil-absorbent materials on a grid and centrifuging the materials to remove extraneous substances therefrom, such as oils, grit, dirt, and metal chips and shavings (Col. 3, lines 17-33). The oil-absorbent materials are then dry cleaned in a double distilled dry cleaning fluid, such as PERC, to remove additional oils and remaining substances from the materials (Col. 4, lines 8-14). The '353 patent does not disclose or suggest n-PB in any way, much less the use of n-PB as a cleaning fluid.

7. Carnovale reportedly discloses a drying circuit for dry cleaning machines using commercially available n-PB as a solvent, where the vapor pressure of the n-PB has negligible values (Carnovale at ¶ [0012]). In particular, Carnovale teaches immersing a metal cooling coil in a solvent holding tank including the n-PB, which is kept at a temperature between 0°C and -20°C. This allegedly causes the vapor pressure of the n-PB to be kept at low levels to limit the evaporation of n-PB while in the solvent tank (Carnovale at ¶¶ [0014] and [0022]).

8. Initially, one of ordinary skill in the art would not have expected the method and apparatus described in Carnovale to work or function. Carnovale correctly states that PERC was first introduced in dry cleaning in the mid-1960s and has since monopolized the market to become the most widely-used solvent (Carnovale at ¶ [0003]). Carnovale then contradicts itself, however, by stating that the use of PERC was in practice prevented (Carnovale at ¶ [0004]). The subsequent paragraph states that the industry reacted by proposing the use of alternative solvents, such as hydrocarbon solvents (Carnovale at ¶ [0005]). In reality, however, the use of hydrocarbons as solvents predates the use of PERC and has been used by the dry cleaning industry since approximately the 1940s. Such inconsistencies immediately call into question the breadth of Carnovale's knowledge and understanding about dry cleaning, let alone suggesting how to suitably use n-PB as a cleaning solvent.

9. For example, due to the highly corrosive nature of n-PB as to certain metals, the Carnovale setup could not function properly. As shown to the Examiner during the interview of October 6, 2005, a galvanized steel pipe model from my experimental dry cleaning machine showed visibly significant corrosion due to exposure for about a year to

only the vapors of n-PB. As a result, prolonged immersion of the cooling coil in a tank of commercially available n-PB, as taught in Carnovale, would surely corrode or otherwise damage the cooling coil actually dipped in n-PB, possibly to the extent of structural failure of the piping, causing release of hazardous air pollutants or other environmentally damaging coolant materials. This is especially true if the cooling coil in Carnovale is made of galvanized steel, which is the industry standard. Therefore, use of commercially available n-PB in the Carnovale dry cleaning machine would have been – and is – unsuitable and avoided in practice because of the considerable and prohibitive problems where the Carnovale device, as described, would not have been expected to operate - or would not properly operate.

10. More importantly, even assuming that the Carnovale disclosure would operate, one of ordinary skill in the art would not have been motivated to incorporate commercially available n-PB, as noted in Carnovale, as a cleaning fluid with the cleaning system disclosed in the '353 patent. First, the '353 patent does not suggest any problems with the use of widely available PERC as a well known cleaning fluid in the cleaning method disclosed therein. Therefore, there would have been no motivation to look for a substitute cleaning fluid for PERC. In fact, I did not have a motivation to do so at the time the '353 patent was filed, in part because PERC was significantly less expensive than n-PB and in wide commercial use. As noted above, Carnovale did not appear to have a working device such that one of ordinary skill in the art would have looked to Carnovale or commercially available n-PB as a PERC replacement, even if a PERC replacement were sought.

Moreover, one of ordinary skill in the art would not have used commercially available n-BP as a cleaning fluid based on a cost analysis. Such an analysis would appear to show that substituting n-PB for PERC would not be economically advantageous. Commercially available n-PB typically costs as much three times more than PERC, and such an increase in cost would have been prohibitive and dissuaded those of ordinary skill in the art from using n-PB over PERC in cleaning processes even if it was expected to be available for dry cleaning purposes.

But it was not. Indeed, one of ordinary skill in the art would not have believed that commercially available n-PB could even be used in dry cleaning applications. As of June 2003, the EPA had only proposed acceptable uses of n-PB as a solvent for metal, electronics, and precision cleaning; as an aerosol solvent; and as a carrier solvent in adhesives (See Exhibit 1). Thus, commercially available n-PB was not categorized - or even available - as a possible dry cleaning fluid due to certain hazardous substances present in commercially

available n-PB materials such as TECHTRIDE[®], even if a motivation existed to locate a suitable PERC replacement.

11. One of ordinary skill in the art who was aware of the '353 patent and Carnovale would have also reviewed the Material Safety Data Sheet ("MSDS") for commercially available n-PB to examine its "valid characteristics" before using such a solvent in a dry cleaning process, such as disclosed in the '353 patent. The MSDS for TECHTRIDE[®], a typical commercially available form of n-PB, includes several indications that would have advised against use of such a chemical in dry cleaning machines (See Exhibit 2). Thus, the MSDS provides several reasons to avoid using n-PB in dry cleaning.

For example, the MSDS states that the commercially available n-PB should not be exposed to elevated temperatures (Exhibit 2 at page 4, section X). On the contrary, the '353 patent teaches that the n-PB is distilled using two distillers during reclamation of the n-PB to separate out the oils from the dry cleaning fluid (Col. 4, lines 8-22). To affect phase separation, distillation equipment must be able to achieve a temperature of approximately 70°C and 150°C. As such, one of ordinary skill in the art would not have expected that the use of commercially available n-PB would be feasible in the dry cleaning process disclosed in the '353 patent due to its elevated distillation temperature requirements.

The MSDS for commercially available n-PB also states that prolonged contact with metals such aluminum, magnesium, or zinc must be avoided. Specifically, a reaction may occur during contact with aluminum fines (Exhibit 2 at page 4, section X). The dry cleaning process of the '353 patent, however, includes the use of n-PB to clean the oil-absorbent materials in dry cleaning machines, the materials containing oils as well as metal fines and other wastes that were not removed during the initial draining and centrifuging steps. These metal fines and other wastes are collected from the dry cleaning machine in a trap (Col. 4, lines 50-52). Thus, one of ordinary skill in the art would not have been motivated to use n-PB from Carnovale in a dry cleaning process as taught by the '353 patent because of the expected danger of an undesired chemical reaction.

12. Even if a motivation existed to try or even use n-PB in a dry cleaning process like that of the '353 patent, there would also have been no reasonable expectation of success for using commercially available n-PB as a cleaning fluid in dry cleaning machines. For example, the MSDS also states that the commercially available n-PB contains additional chemicals that have adverse toxicological effects. Such chemicals include, for example, 1,2

Butylene Oxide and Sec-Butyl Alcohol (Exhibit 2 at page 4, section XI). These chemicals are added to commercially available n-PB as stabilizers. The use of commercially available n-PB containing these stabilizers, however, requires proper permits, disposal, and treatment of the chemicals as hazardous substances, as required by the EPA. For example, if commercially available n-PB containing these stabilizers was used in the dry cleaning process of the '353 patent, such chemicals would tend to collect in the distillation equipment and cause a buildup of hazardous materials that would be environmentally damaging, particularly if a leak occurred. This would have been expected to invoke multiple state and federal laws regarding disposal and treatment of the chemicals as hazardous substances, and add to the overall cost and complexity involved with the use of commercially available n-PB. As such, one of ordinary skill in the art would not have expected that the use of commercially available n-PB, which includes stabilizers formed of several hazardous materials, would have been economically feasible, let alone possible.

13. One preferred embodiment of the claimed invention, on the other hand, does not incorporate the use of commercially available n-PB as a cleaning fluid. Rather, the n-PB that is used consists essentially of n-PB and does not contain certain common stabilizing chemicals that are hazardous air pollutants found in commercially available n-PB. It was only through my discovery of the benefits of n-PB as a dry cleaning fluid that a commercial n-PB supplier prepared n-PB at my request while avoiding addition of the typical hazardous air pollutants included in conventional n-PB formulations, as taught in the MSDS. Indeed, the EPA-approved uses of n-PB required these stabilizers for those purposes, but I discovered not only the ability to operably avoid such hazardous stabilizers, but also the environmental benefits of doing so. Thus, the disadvantages associated with disposal and treatment of hazardous chemicals are surprisingly and unexpectedly avoided, while rendering such cleaning fluids suitable for use in dry cleaning processes according to the invention.

14. It is thus my opinion and judgment, as one of ordinary skill in the art, and in light of the then-current state of knowledge and uses surrounding commercially available n-PB, that the claimed invention is not obvious over the '353 patent in view of Carnovale. There was no motivation to use commercially available n-PB with the dry cleaning methods disclosed in the '353 patent, in part because there was no suggestion that PERC was unsuitable as a cleaning fluid, not to mention the significantly increased cost of n-PB would have motivated one of ordinary skill in the art to find a different PERC

replacement. Moreover, n-PB was regulated by the EPA and not noted as being available for applications outside of aerosol sprays, carriers in adhesives, and industrial degreasing. There was no reasonable expectation of success--prior to the present invention--in using commercially available n-PB in the dry cleaning method of the '353 patent due to MSDS indications that advised against the use of commercially available n-PB materials in combination with aspects incorporated in the dry cleaning process of the '353 patent. Thus, it is my opinion that the claimed invention is patentable over the cited references.

15. I further declare that all statements made herein of my knowledge are true and all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

10-17-2005

Date



Richard G. MIDDLETON

MATERIAL SAFETY DATA SHEET

TECHTRIDE® NPB-DG

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PARTS CLEANING TECHNOLOGIES 3114 Cullman Ave. Charlotte NC 28225-5278 EMERGENCY TELEPHONE NUMBER: (800) 424-9300 INFORMATION TELEPHONE NUMBER: (704) 372-9280 DATE PREPARED: 07/31/02 SUPERSEDES: N/A	HMS RATINGS HEALTH: 1 FIRE: 0 REACTIVITY: 0 <div style="text-align: center;"> NFPA </div>
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SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: TECHTRIDE® NPB - DG
CAS NUMBER: Not Applicable- Mixture
CHEMICAL FAMILY: N/A

SECTION II - COMPOSITION / INFORMATION ON INGREDIENTS

CAS NUMBER	HAZARDOUS COMPONENT	NTP	IARC	OSHA PEL (ppm)	ACGIH TLV (ppm)	OTHER LIMITS (ppm)
106-94-5	N-Propyl Bromide	N	N	N/A	N/E	25-100 ¹
106-88-7	1,2 Butylene Oxide	Y	2B	N/A	N/E	N/E
78-92-2	Sec-Butyl Alcohol	N	N	150	100	150 ST -NIOSH
75-65-0	2-Methyl-2-Propanol (T-Butyl Alcohol)	N	N	100	100	N/E
109-87-5	Dimethoxymethane	N	N	1000	1000	N/E
646-06-0	1,3-Dioxolane	N	N	N/E	N/E	N/E
Proprietary	Ethers	N	N	N/E	N/E	N/E

SECTION III - HAZARD IDENTIFICATION

ROUTES OF ENTRY:

Inhalation and dermal are the primary routes of entry, although other avenues should be considered.

INHALATION:

Exposure to high doses may cause central nervous system (CNS) depression (anesthetic-like effects). Doses that affect the CNS in this fashion may also cause adverse effects on the liver, lung, and kidney. Possible changes to bone marrow. Symptoms of inhalation exposure may include: headache, dizziness, nausea, shortness of breath, and irritation of the respiratory tract (nose, throat, and lungs) including sore throat and cough.

EYE

Eye irritant. Contact with eyes may cause discomfort and pain.

DERMAL

Product may cause mild irritation, rashes, defatting and possibly dermatitis. Problem may be accentuated by trapping the liquid against the skin.

SECTION III - HEALTH HAZARD INFORMATION

¹ Manufacturers of N-Propyl Bromide have set varying levels of exposure ranging from 25 to 100 ppm. Preliminary test data suggests the final value may lie somewhere within this range. Neither EPA nor OSHA has set exposure values for this material.

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MATERIAL SAFETY DATA SHEET**TECHTRIDE® NPB-DG**

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INGESTION:

May irritate the digestive tract. Symptoms may include mild nausea, abdominal pain, vomiting, and diarrhea. Low order of Toxicity.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Persons with pre-existing skin disorders, or impaired liver, kidney or pulmonary function disorders may be more susceptible to certain components of this product.

GENERAL

Product may cause reproductive effects based on animal studies. Target organs include kidneys, CNS, liver, and bone marrow. 1,3-Dioxolane is listed as a Mutagen.

SECTION IV - FIRST AID MEASURES**INHALATION:**

Remove individual to fresh air. If breathing is difficult provide oxygen by a trained health care professional. If not breathing, give artificial respiration, preferably mouth-to-mouth. Consult a physician.

EYE:

Flush eyes with copious amounts of water for at least 15 minutes. Contact physician if irritation persists.

SKIN CONTACT:

Thoroughly wash affected area with soap and water at least 15 minutes; consult physician if irritation persists or is severe. Remove all contaminated clothing and laundry prior to reuse. Properly discard all leather articles that are soaked with product.

INGESTION:

Do NOT induce vomiting, seek medical attention. If unconscious or in convulsions take immediately to the hospital. If conscious, give 1 pint of water. Never administer anything by mouth to an unconscious person. If vomiting occurs spontaneously keep individual's head below their hips to prevent aspiration of material into the lungs.

NOTE: consult a physician in all areas of exposure. First-aiders need to provide for their own safety before attempting to provide assistance.

SECTION V - FIRE FIGHTING MEASURES**FLASH POINT:** N/A**FLAMMABLE LIMITS:****LEL:** N/D**UEL:** N/D**EXTINGUISHING MEDIA:**

Dry chemical (BC or ABC), foam, or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus for possible exposure to toxic by-products of combustion as denoted in Section X. Protective gear may be needed to prevent skin contact. Water may be used to keep containers cool.

UNUSUAL FIRE FIGHTING PROCEDURES:

Vapors of this product are heavier than air and can travel considerable distances. Product may form flammable mixtures with air in some cases. Toxic and corrosive gases can be generated if exposed to a source of ignition or high temperatures. NFPA rates N-Propyl Bromide as flammable (FP <75°F). Testing of similar DETRIDE products using a Pensky-Martin apparatus did not produce ignition within the cup, indicating there is no flash point. However, vapors at elevated temperatures did burn as long as an external source of ignition, such as an open flame, was provided. Removal of the ignition source extinguished the flame.

SECTION VI - ACCIDENTAL RELEASE MEASURES

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TECHTRIDE® NPB-DG

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Immediately evacuate the area and provide maximum ventilation. Shut off sources of ignition. Unprotected personnel should move upwind of the spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in the area. Dike area to contain the spill. Take precautions as necessary to prevent contamination of the ground and surface waters. Recover spilled material on absorbents, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including vapors, have been removed, thoroughly wet vacuum the area. Do not flush to the sewer. If area is porous, remove as much earth and gravel, etc., as necessary and place in closed containers for disposal.

SECTION VII - HANDLING AND STORAGE

- Wear PPE when handling this material. Wash exposed body areas with soap and water prior to using lavatory facilities, consuming food or beverages or applying cosmetics.
- Ventilation must be sufficient to limit employees' exposure. Do not use in poorly ventilated or confined spaces without proper respiratory protection.
- Do not eat, drink or smoke in work areas.
- Avoid contact with eyes and skin.
- Do not ingest.
- Do not use cutting or welding torches on containers that contained this product, unless, the containers are properly purged and cleaned.
- Store in the original, closed, properly sealed and labeled container.

SECTION VIII - EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION:

General ventilation is recommended to keep employees exposure to below established OSHA and recommended manufacturer's limits.

RESPIRATORY PROTECTION:

To limit employees' exposure, OSHA requires that the use of administrative or engineering controls must first be developed and implemented whenever feasible (29CFR 1910.1000 (c)). When controls are not feasible, and exposure exceeds established limits, then protective equipment such as respirators are recommended. Use only OSHA/NIOSH approved respirators according to the manufacturer's directions and OSHA requirements. Positive pressure, self-contained units (i.e., SCBAs) are required whenever there is insufficient oxygen, IDLH conditions exist, and when determined necessary by surrounding environmental conditions.

EYE PROTECTION:

Splash proof goggles, face shields where splashing may be present. Eyewash should be available in areas where this product is handled.

DERMAL PROTECTION:

Protect all exposed skin from liquid contact. Use chemically resistant gloves. Aprons and other protective equipment should be used when there is a chance for splashing.

SECTION IX - PHYSICAL/CHEMICAL PROPERTIES

BOILING POINT	Approx. 71°C	SPECIFIC GRAVITY	1.32
VAPOR PRESSURE (mm Hg)	> 140 @ 20°C	MELTING POINT	-110°C
VAPOR DENSITY (AIR = 1)	≥ 3	EVAPORATION RATE (Butyl Acetate = 1)	≥ 2

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SOLUBILITY IN WATER: 2.5 g/l; stabilizers are soluble.	APPEARANCE AND ODOR: Clear, colorless liquid with Ether like odor
OTHER INFORMATION	VOLATILE: 100 %

SECTION X - STABILITY & REACTIVITY

STABILITY: STABLE

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Products of decomposition include: CO, CO₂, HBr, Methyl Bromide, and other unknown products of decomposition.

HAZARDOUS POLYMERIZATION: Hazardous polymerization does not occur.

INCOMPATIBILITY:

CONDITIONS TO AVOID:

Do not store or expose material to elevated temperatures. Avoid contact with open flames, electric arcs, or other sources of ignition.

MATERIALS TO AVOID:

Strong alkalis and strong oxidizers. Prolonged contact with metals such as aluminum, magnesium, or zinc must be avoided. Care should be used when storing used DETRIDE DG, which may contain aluminum fines as a reaction may occur.

SECTION XI - TOXICOLOGICAL INFORMATION

TOXICOLOGY STUDIES:

Toxicology studies have not been conducted on this product as a whole.

	LD ₅₀ (oral-rat)	LD ₅₀ (dermal-rabbit)	LC ₅₀ (inhalation-rat)
n-Propyl Bromide	4,260 mg/kg	N/D	253,000 mg/m ³ /0.5 hr
1,2 Butylene Oxide	1,600 mg/kg	N/D	8,800 mg/m ³ /30m
Sec-Butyl Alcohol	6,480 mg/kg	N/D	16,000 ppm / 4hr. ⊙
T-Butyl Alcohol	3,500 mg/kg	N/D	5,000 ppm / 7Hr (female) ⊙
Dimethoxymethane	5,708 mg/kg ⊙	N/D	15,000 ppm
1,3-Dioxolane	3,000 mg/kg	8,480 mg/kg	20,650 mg/M ³ /4 hr

⊙ ori-rbt

⊙ LD₅₀ lowest published lethal concentration

SECTION XII - ECOLOGICAL INFORMATION

Sec-Butyl Alcohol: is expected to readily biodegrade when released to soil or water. Half-life in water is expected to be between 1 to 10 days. Bio Accumulation factor (BAF) is estimated as being less than 100. Material has an octanol-water partition coefficient of less than 3.0.

n-Propyl Bromide: 96 hour LC₅₀ for fathead minnows is 67,300 ug/l

1,2 Butylene Oxide has an octanol / water coefficient, as log POW, of 0.416

SECTION XIII - DISPOSAL CONSIDERATIONS

Contaminated sawdust, vermiculite or porous surface must be properly disposed. Recovered liquids may be reprocessed or properly disposed. Care must be taken when using or disposing of chemical materials and/or their containers in accordance with the Clean Air Act, The Clean Water Act, The Resource Conservation And Recovery

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Act, The Department of Transportation, as well as any other relevant federal, state, or local laws/regulations regarding disposal.

SECTION XIV - TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: Non-Hazardous
HAZARD CLASS: N/A
IDENTIFICATION NUMBER: N/A
PACKING GROUP: N/A
REQUIRED LABELS: N/A
REPORTABLE QUANTITY: N/A

SECTION XV - REGULATORY INFORMATION**OSHA**

This product is subject to the Hazard Communication Standard under 29 CFR 1910.1200 based on the ingredients found in Section II.

STATE

Components of this product are listed under the following state RTK programs: FL, PA, and MA

RCRA

Refer to Section XIII for information

SARA

302 (40 CFR § 355): this product does not contain any Extremely Hazardous Substances
311/312(40 CFR § 370): Submission of MSDS to the LEPC, SERC, and the local fire department are required.
Material meets the following EPA hazard categories for reporting:

X	Acute health hazard	X	Chronic health hazard
	Fire hazard		Reactive hazard
	Sudden release of pressure hazard		

313 (40 CFR § 372): This product may trigger reporting requirements for the end user of this product for the following materials:

2-Methyl-2-Propanol	< 5%
1,2-Ethoxybutane	< 5%

CAA

1,2 Butylene Oxide is listed as a HAP under the CAA

TSCA

All materials in this product are listed in Inventory List.

SECTION XVI - OTHER INFORMATION

N/A = NOT APPLICABLE
N/D = NOT DETERMINED

N/E = NOT ESTABLISHED
S = SUSPECTED

ST = SHORT TERM EXPOSURE LIMIT
C = CEILING

2B - The agent is possibly carcinogenic to humans. The exposure circumstance entails exposures that are possibly carcinogenic to humans.

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This category is generally used for agents for which there are limited evidence in humans in the absence of sufficient evidence in experimental animals. It may also be used when there is inadequate evidence of carcinogenicity in experimental animals. In some instances, an agent for which there is inadequate evidence or no data in humans, but limited evidence of carcinogenicity in experimental animals together with supporting evidence from other relevant data, may be placed in this group.

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EPA's Proposed Regulation of n-Propyl Bromide

What is n-propyl bromide, and why is EPA regulating it?

n-propyl bromide (nPB), also called 1-bromopropane, is a non-flammable organic solvent with a strong odor. Its Chemical Abstracts Service Registry Number (CASRN) is 106-94-5. It is used to remove solder flux, wax, oil, and grease from electronics parts, metals, and other materials. In addition, nPB is used as a solvent in adhesive formulation. Some brand name products using nPB in their formulas include Abzol®, EnSolv®, and Solvon® cleaners, as well as Whisper Spray® and fire retardant Soft Seam adhesives.

EPA is evaluating nPB's effects on human health and the environment under the SNAP Program to determine if it is safer than the ozone-depleting substances (ODS) it replaces and other available solvents. In particular, EPA proposes to allow the use of nPB as a substitute for ODS with certain conditions because of its toxicity and potential health effects on people who are exposed to it.

Through its Significant New Alternatives Policy (SNAP) Program, the U.S. Environmental Protection Agency (EPA) is proposing to allow the use of n-propyl bromide (nPB) as a chemical alternative to ozone-depleting substances (ODS) with certain conditions. The SNAP Program thoroughly studies alternatives, such as nPB, to ensure that the use of replacement chemicals will not pose significant risk to human health and to the environment. This fact sheet answers some commonly asked questions about EPA's proposed regulations on the appropriate use of nPB.

How does EPA propose to regulate the use of n-propyl bromide (nPB)?

EPA proposes to list nPB as a chemical acceptable for use as:

- A solvent for metal cleaning, electronics cleaning, and precision cleaning;
- An aerosol solvent; and
- A carrier solvent in adhesives.

EPA also proposes that nPB used for these purposes contains no more than 0.05 percent isopropyl bromide (also called 2-bromopropane, CASRN 75-26-3) by weight before it is combined with other chemicals.

What are the environmental impacts of nPB?

At the latitude of the U.S., nPB has an ozone depletion potential (ODP) of 0.013 to 0.018, much lower than that of the ODS that it would replace—CFC-113, methyl chloroform, and HCFC-141b. At tropical latitudes, nPB has an ODP of 0.07 to 0.10,

close to that of methyl chloroform and HCFC-141b. EPA is basing its proposed decision on the ODP in the United States.

nPB has a low global warming potential (GWP) of 0.31 compared to a value of 1 for CO₂ over 100 years. nPB may contribute to smog and is currently regulated as a volatile organic compound (VOC).

What is the recommended exposure level of nPB in the workplace?

EPA recommends that individuals inhale no more than an average of 25 parts per million (ppm) of nPB during an eight-hour workday.

How did EPA develop an exposure limit for nPB?

EPA based its proposed exposure limit on information drawn from several toxicological studies, including those that reveal nPB's effects on the liver, central nervous system, and reproductive system of test animals.



How does EPA's recommended exposure limit for nPB compare to industry standards and regulatory requirements?

To date, the Occupational Safety and Health Administration (OSHA) has not issued a Permissible Exposure Limit (PEL) for nPB. At OSHA's request, the National Toxicology Program will perform a number of studies on the effects of nPB. When these studies are completed (studies could take several years), EPA anticipates that OSHA will set a mandatory nPB workplace exposure limit. An OSHA PEL would supersede EPA's recommended workplace exposure limit.

Similarly, the National Institute for Occupational Safety and Health (NIOSH), the American Industrial Hygiene Association (AIHA), and the American Conference of Governmental Industrial Hygienists (ACGIH) have not yet established a workplace exposure limit for nPB. The exposure limit being developed by AIHA or ACGIH may differ from EPA's proposed valuation; however, these organizations will consider seriously EPA's recommendation.

Where can I find a copy of EPA's proposed rule?

EPA's proposed nPB regulations were published in the *Federal Register* on June 3, 2003. The proposed rule can be downloaded from the Federal Register Website at <http://www.gpoaccess.gov/fr/index.html> or from EPA's SNAP Program Website at <http://www.epa.gov/ozone/snap>. The name of the proposed rule is: "Protection of Stratospheric Ozone: Listing of Substitutes for Ozone-Depleting Substances—n-Propyl Bromide."

How can I access EPA's information related to nPB?

EPA maintains information on nPB in a public file, which can be accessed by:

- Visiting the EPA Docket Center Public Reading Room, Room B102, at 1301 Constitution Avenue, NW, Washington, DC;
- Calling (202) 566-1742 and requesting copies of items in Docket #A-2001-07 (there is a charge of 15 cents per page); or
- Visiting EPA's Website at <http://www.epa.gov/edocket> to access public comments or materials available in the electronic docket (OAR-2002-0064).

When will EPA issue a final ruling on nPB?

EPA hopes to issue a final rule in 2004. The actual issue date is dependent on the number and complexity of issues raised by the public in response to the proposed rule.

How and where should I send public comments on EPA's proposed rule?

Public comments should be forwarded to EPA's Air Docket (OAR-2002-0064). To ensure that your comments are considered, please submit all comments by August 4, 2003, the close of the public comment period.

For more information on EPA's proposed rule on nPB:

Contact

Margaret Sheppard
Tel: (202) 564-9163
Email: sheppard.margaret@epa.gov

Visit EPA Website

<http://www.epa.gov/ozone/snap>

Review EPA Docket

Electronic documents are in EPA Docket OAR-2002-0064, which is available at <http://www.epa.gov/edocket>.

Hard copies of documents in Docket A-2001-07 may also be obtained at:

1301 Constitution Avenue, NW
Room B102
Washington, DC
Tel: (202) 566-1742

EPA welcomes comments on the proposed rule. Please send comments to:

Mail

U.S. EPA
Air & Radiation Docket, Mail Code 6102T
Attention: Docket OAR-2002-0064
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Fax

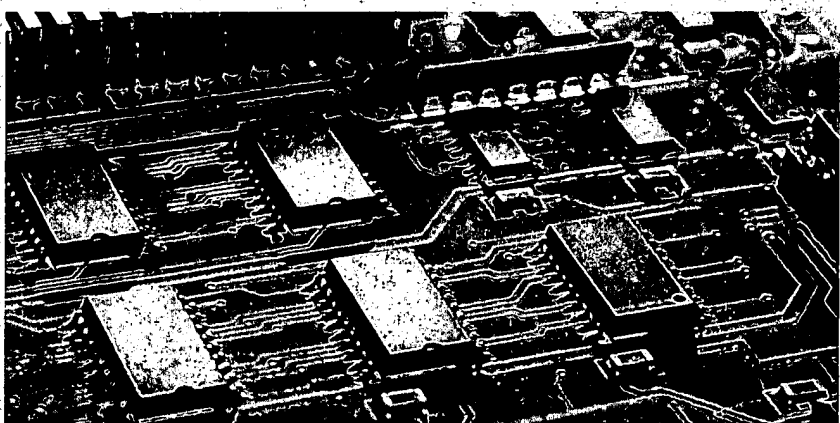
(202) 566-1741

Email

A-And-R-Docket@epa.gov

Internet

Submit electronically to Docket OAR-2002-0064 at <http://www.epa.gov/edocket>.



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